

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method of determining at least one parameter of a fluid stream, comprising the steps of: measuring the volumetric flow rate of the fluid stream; measuring the momentum rate of the fluid stream; and calculating the at least one parameter using the volumetric flow rate and the momentum rate of the fluid stream; wherein the fluid stream comprises phases selected from the group consisting of: at least one liquid phase; and a solid phase and at least one liquid phase.

Claim 2 (original): The method of claim 1 wherein the fluid stream has a mass flow rate and a density, and the at least one parameter is selected from the group consisting of the mass flow rate of the fluid stream and the density of the fluid stream.

Claim 3 (original): The method of claim 2 further comprising the step of transmitting the momentum rate of the fluid stream to a data processing device.

Claim 4 (original): The method of claim 3 further comprising the step of transmitting the volumetric flow rate of the fluid stream to a data processing device.

Claim 5 (original): The method of claim 4 wherein: the at least one parameter is the mass flow rate of the fluid stream; the density of the fluid stream is known; and the step of calculating the at least one parameter further comprises the step of using the data processing device to determine the mass flow rate of the fluid stream by multiplying the volumetric flow rate of the fluid stream by the density of the fluid stream.

Claim 6 (original): The method of claim 4 wherein: the at least one parameter is the density of the fluid stream; and the step of calculating the at least one parameter further comprises the step

of using the data processing device to determine the density of the fluid stream by multiplying the momentum rate of the fluid stream by a numerical constant, and then dividing the product by the square of the volumetric flow rate of the fluid stream.

Claim 7 (original): The method of claim 4 wherein the step of calculating the at least one parameter comprises the steps of: using the data processing device to determine the density of the fluid stream by multiplying the momentum rate of the fluid stream by a numerical constant, and then dividing the product by the square of the volumetric flow rate of the fluid stream; and using the data processing device to determine the mass flow rate of the fluid stream by multiplying the volumetric flow rate of the fluid stream by the density of the fluid stream.

Claim 8 (original): The method of claim 1 wherein the step of measuring the volumetric flow rate of the fluid stream uses a volumetric flow device comprising a turbine flow meter, a magnetic flow meter, or a positive displacement metering pump having a speed sensor and transmitter.

Claim 9 (original): The method of claim 1 wherein the step of measuring the momentum rate of the fluid stream uses a momentum device comprising a wedge meter, an orifice, or a venturi.

Claim 10 (original): The method of claim 9 wherein the wedge meter has a wedge element, and the wedge element comprises a substantially abrasion-resistant material.

Claim 11 (original): The method of claim 1 wherein the step of calculating the at least one parameter uses a data processing device comprising a computer capable of receiving multiple inputs and producing at least one output.

Claim 12 (original): The method of claim 11 wherein the data processing device receives as input an output signal from a volumetric flow device and an output signal from a momentum device, and produces at least one output.

Claim 13 (original): The method of claim 12 wherein the volumetric flow device and the momentum device can withstand an internal pressure of up to about 22,500 psi.

Claim 14 (original): The method of claim 12 wherein the volumetric flow device and the momentum device have a flow area having an inner diameter of up to about 8 inches.

Claim 15 (deleted).

Claim 16 (original): The method of claim 1 wherein the step of measuring the volumetric flow rate of the fluid stream comprises the step of flowing a portion of the fluid stream through a volumetric flow device.

Claim 17 (original): The method of claim 1 wherein the step of measuring the volumetric flow rate of the fluid stream comprises the step of flowing the entirety of the fluid stream through a volumetric flow device.

Claim 18 (original): The method of claim 1 wherein the step of measuring the momentum rate of the fluid stream comprises the step of flowing a portion of the fluid stream through a momentum device.

Claim 19 (original): The method of claim 1 wherein the step of measuring the momentum rate of the fluid stream comprises the step of flowing the entirety of the fluid stream through a momentum device.

Claim 20 (currently amended): A system for determining at least one parameter of a fluid stream having a volumetric flow rate and a momentum rate, comprising: a volumetric flow device for measuring the volumetric flow rate of the fluid stream; a momentum device for measuring the momentum rate of the fluid stream; and a data processing device connected to the volumetric flow device and the momentum device for determining the at least one parameter; wherein the fluid stream comprises phases selected from the group consisting of: at least one liquid phase; and a solid phase and at least one liquid phase.

Claim 21 (original): The system of claim 20 wherein the at least one parameter is selected from the group consisting of mass flow rate and density.

Claim 22 (original): The system of claim 20 wherein the volumetric flow device comprises a turbine flow meter, a magnetic flow meter, or a positive displacement metering pump having a speed sensor and transmitter.

Claim 23 (original): The system of claim 20 wherein the momentum device comprises a wedge meter, an orifice, or a venturi.

Claim 24 (original): The system of claim 23 wherein the momentum device comprises a wedge meter having a wedge element, and wherein the wedge element comprises a substantially abrasion-resistant material.

Claim 25 (original): The system of claim 20 wherein the data processing device comprises a computer capable of receiving multiple inputs and producing at least one output.

Claim 26 (original): The system of claim 25 wherein the data processing device receives as input an output signal from the volumetric flow device and an output signal from the momentum device, and produces at least one output.

Claim 27 (original): The system of claim 20 wherein: the at least one parameter is the mass flow rate of the fluid stream; the density of the fluid stream is known; and the data processing device determines the at least one parameter by multiplying the density of the fluid stream by the volumetric flow rate of the fluid stream.

Claim 28 (original): The system of claim 20 wherein: the at least one parameter is the density of the fluid stream; and the data processing device determines the at least one parameter by multiplying the momentum rate of the fluid stream by a numerical constant, and then dividing the product by the square of the volumetric flow rate of the fluid stream.

Claim 29 (original): The system of claim 20 wherein: the at least one parameter is the density and the mass flow rate of the fluid stream; the fluid stream flows through the momentum device and the volumetric flow device; the data processing device determines the density of the fluid stream by multiplying the momentum rate of the fluid stream by a numerical constant, and then dividing the product by the square of the volumetric flow rate of the fluid stream; and the data processing device determines the mass flow rate of the fluid stream by multiplying the volumetric flow rate of the fluid stream by the density of the fluid stream.

Claim 30 (original): The system of claim 20 wherein the volumetric flow device and the momentum device can withstand an internal pressure of up to about 22,500 psi.

Claim 31 (original): The system of claim 20 wherein the volumetric flow device and the momentum device have a flow area having an inner diameter of up to about 8 inches.

Claim 32 (deleted).

Claim 33 (original): The system of claim 20 wherein the fluid stream does not flow through the momentum device and the volumetric flow device in its entirety.

Claim 34 (original): The system of claim 20 wherein the fluid stream flows through the momentum device and the volumetric flow device in its entirety.

Claim 35 (original): The system of claim 20 wherein the momentum device is connected in fluid communication in series with the volumetric flow device.